

Patent Claims

1. Endoscope (2) with hygiene protection (1), which comprises
 - a cover (4),
 - which is closed at the distal end (3) thereof and which, at least at its front face, is transmissible for optical information, and
 - which can be rolled on in the manner of a condom in the axial direction of the endoscope (2), and
 - one or more working channels (6a to 6b) which extend parallel to the endoscope (2) and terminate at the distal end (3) of the cover (4),
characterised in that
 - the working channels (6a to 6b) are only connected to the distal end (3) of the cover (1),
 - in addition to the working channels (6a to 6b), one or more vacuum channels (7) with one or more openings, which terminate at that side of the cover (4) facing away from the patient, are provided. and
 - the working channels (6a to 6b) are positioned between the outer side of the endoscope (2) and the inside of the cover (4).
2. Endoscope according to claim 1, **characterised in that** it is a medical endoscope which has a variable diameter in the cross-section
3. Endoscope according to one of claims 1 and 2, **characterised in that** the cover (4) consists of a material that is airtight and watertight and is impermeable to pathological microorganisms, and the connection of the working channels (6a to 6b) to the distal end (3) of the cover (4) is airtight and watertight and is impermeable to pathological microorganisms.

4. Endoscope according to one of the preceding claims,
characterised in that the cover (4) consists of an elastic rubber-like material as is conventionally used for medical purposes.
5. Endoscope according to one of the preceding claims,
characterised in that the cover (4) is flexible and elastic and can be folded up in the manner of a bellows in the axial direction of the endoscope (2).
6. Endoscope according to one of the preceding claims,
characterised in that the cover (4), at least in some sections, has an internal diameter that is slightly larger than the external diameter of the endoscope (2).
7. Endoscope according to one of the preceding claims,
characterised in that the cover (4) encloses at least those parts of the endoscope (2) that are introduced into the body orifices of the patient.
8. Endoscope according to one of the preceding claims,
characterised in that a transparent pane or a lens is provided on the distal end (3) of the cover (4) at its front face.
9. Endoscope according to claim 8, **characterised in that** the pane or the lens entirely or partly forms the front face of the distal end section (3).
10. Endoscope according to one of the preceding claims,
characterised in that the distal end section (3) of the cover (4) is designed as an optically transparent cap (3).
11. Endoscope according to claim 10, **characterised in that** the wall thickness of the cap-like distal end section (3) is greater than the wall thickness of the cover (4) in the non-distal region.

12. Endoscope according to one of the preceding claims,
characterised in that the cover (4), which is open at the proximal end, can be fixed so as to be airtight on the shaft of the endoscope (2).
13. Endoscope according to claim 12, **characterised in that** the cover (4) is conically enlarged in the region of the proximal end and the part of the cover that is folded back so as to be wrinkle-free in this region can be fixed by means of a chemically inert and non-toxic adhesive.
14. Endoscope according to one of the preceding claims,
characterised in that a tear thread, which is connected to the cover (4) at the distal end of the endoscope, runs parallel to the endoscope on the inside of the cover, over the entire length or a part of the length thereof.
15. Endoscope according to one of the preceding claims,
characterised in that at least one of the working channels (6a to 6c) is provided for introducing liquids and/or air.
16. Endoscope according to one of the preceding claims,
characterised in that at least one of the working channels (6a to 6c), with an appropriate wall thickness, is provided as a suction line for removing body fluids.
17. Endoscope according to one of the preceding claims,
characterised in that at least one of the working channels (6a to 6c) is provided for guiding equipment that serve for the removal of biopsies.
18. Endoscope according to one of the preceding claims,
characterised in that the vacuum channel or vacuum channels (7) extend over the entire length of the cover (4) or a part of the

cover (4).

19. Endoscope according to one of the preceding claims,
characterised in that a subatmospheric pressure is applied to
the vacuum channel or vacuum channels (7) during the use of
the endoscope (2)..
20. Endoscope according to one of the preceding claims,
characterised in that the outside of the endoscope (2) has
depressions in the axial directions, which correspond in shape
and depth to the diameter and profile of the working (6a to 6c) and
vacuum channels..
21. Endoscope according to claim 20, **characterised in that** the
width of the depressions running in the axial direction on the
outside of the endoscope (2) is slightly smaller in dimension than
the width of the depression in its centre point.
22. Endoscope according to one of the preceding claims,
characterised in that the working (6a to 6b) and vacuum
channels are firmly and/or detachably connected to the distal end
of the cover (4).
23. Endoscope according to claim 22, **characterised in that** the
detachable working (6a to 6b) and vacuum channels have airtight
and watertight connecting elements at the proximal and/or distal
end of the cover..
24. Endoscope according to one of claims 22 and 23, **characterised**
in that the connecting elements of the working (6a to 6b) and
vacuum channels are compatible at the proximal end with the
valve connections that are conventional in endoscopy.
25. Endoscope according to one of the preceding claims,

characterised in that the working (6a to 6b) and vacuum channels are connected to a control unit for operating the endoscopy channels.

26. Endoscope according to claim 25, **characterised in that** the control unit for operating the endoscopy channels is preferably provided for one-off use and is made of plastic.

27. Method for attaching a hygiene protection to a medical endoscope according to one of claims 1 to 19 and 22 to 26, **characterised in that**

- the window at the distal end of the cover (4) is coated on the inside thereof with a material that produces optical contact between the window and the optical channel of the endoscope (2)
- the distal end of the endoscope (2) is introduced into the cover (4), which is open at the proximal end and closed at the distal end thereof
- the cover (4), which is rolled up in the manner of a condom or folded up in the manner of bellows, is rolled on or unfolded with enclosure of the endoscope (2) and the working channels (6a to 6c)
- a subatmospheric pressure is applied to the vacuum tube

28. Method for attaching a hygiene protection to a medical endoscope according to one of claims 1 to 26, **characterised in that**

- the window at the distal end of the cover (4) is coated on the inside with a material that produces optical contact between the window and the optical channel of the endoscope (2)
- the distal end of the endoscope (2) is introduced into the cover (4), which is open at the proximal end and closed at the distal end thereof

- the working channels (6a-6c), which are fixed at the distal end of the cover, are positioned in the depressions provided on the outside of the endoscope (2)
- the cover (4), which is rolled up in the manner of a condom or folded up in the manner of bellows, is rolled on or unfolded with enclosure of the endoscope (2) and the working channels (6a to 6c)
- a subatmospheric pressure is applied to the vacuum tube